

(Invited article for *Bob Ryan's Almanac 2001*)

## HOW I BECAME AN ASTRONOMER

Stephen P. Maran, NASA's Goddard Space Flight Center

Life as an astronomer has taken me to view eclipses of the Sun from the Gaspe' Peninsula to the Pacific Ocean and the China and Coral Seas, and to observe the stars at observatories across the USA and as far south as Chile. I've also enjoyed working with NASA's telescopes in space, including the Hubble Space Telescope and the International Ultraviolet Explorer. It seems funny to reflect that it all began in the Sixth Grade by a fluke – the consequence of a hoax letter whose author I never identified.

That unknown hoaxer wrote that I had been chosen to join a new club for the "leading science students of the New York City public schools" and directed me to a basement room at the American Museum of Natural History where there was no such new organization. But it was the noisy office of a kids' astronomy club that had been based there since 1929. I was interested in dinosaurs, not nebulae, but the dues were only 50 cents per year, so I joined the Junior Astronomy Club (JAC).

In the early 1950s, the skies over a metropolitan area like New York were much darker than now. Once I attended my first JAC star-gazing session at a deserted golf course on the far edge of the Bronx, I was hooked for life. The starry skies were mesmerizing, meteors flashed above, planets beckoned through small telescopes that the members brought along by subway. Several kids whom I met at the club became astronomy professors at universities across the country, from New York to L.A.

Soon I was attending a special school for science in Manhattan, Stuyvesant High School. The students arrived by subway and bus from all over New York, slide rules dangling from our belts. Biology lab, featuring the dissection of frogs, was held during lunch hour one year. Not everyone ate. The football team was no powerhouse, but our Math Team ruled.

By then, I had read how spectacular supernovas (exploding stars) appeared in the sky long ago. The last one was Kepler's Star, in 1604. Little did I dream that I would live to see a bright supernova over South America in 1987, the first one visible to the naked eye in 383 years!

A college major in math or physics was necessary to qualify for graduate school in Astronomy. I managed to major in both. But when I got to graduate school, the relatively new skill of computer programming, which I had learned on a summer job, was most in demand. Graduate school was five years of toil on professors' projects. You operated a telescope all night (including leaving it to track on its own while you ran down to the darkroom to develop the last exposure), dozed through class in the morning and worked on problem sets or programmed the computer in the afternoon. Social life? You've got to be kidding. "The computer" was a huge IBM main frame machine that

served the entire University of Michigan. There was no such thing as a personal computer back then, or even an electronic calculator.

There are two things you must do in graduate school – satisfy the requirements and actually learn the business of being an astronomer. “Satisfying the requirements” means passing your courses, selecting a Ph.D. research thesis, and completing the thesis. “Learning the business” means absorbing how astronomers actually do their work, which is never really written down. You learn by doing.

I was recruited from graduate school to work at the new Kitt Peak National Observatory in Tucson, Arizona. It was exciting to be surrounded by dozens of astronomers, many already famous researchers, and to have access to some of the most advanced facilities in the world. I started work in a basement lab, creating artificial aurora borealis in a big glass ball, but was soon tapped to manage a project to build the first major remotely controlled, computerized telescope. It was a wonder of the technical world of the mid-1960s, with a narrow mountaintop room filled with banks of electronics and flashing colored lamps. At headquarters in Tucson, 56 miles away, a computer driven by punched paper tape sent instructions to the mountain. VIPs, Congressmen and once, rocket pioneer Wernher von Braun, all came to tour our facility and see the apparatus run through its paces, the dome turning noisily as the telescope slewed into position to point at a star as a robot arm uncovered one of the mirrors. Sometimes, the apparatus actually worked, but we were, as they say, “ahead of our time.”

In 1969, I headed east to join Goddard Space Flight Center as a Project Scientist for Orbiting Solar Observatories and later, Manager of “Operation Kohoutek,” an early attempt at organizing dozens of observatories to concentrate on a passing celestial visitor. I began to contribute magazine articles on current developments in astronomy to the then-new *Smithsonian* magazine, and other publications, and to write and edit books as well: from *Physics of Nonthermal Radio Sources* to *Astronomy for Dummies*. Most scientists take a sabbatical year to get away from teaching, but after seven years of research at Goddard, I took a sabbatical at UCLA, where I enjoyed lecturing to bright undergraduate classes.

Returning to Goddard in 1977, I was swept up in what became the Hubble Space Telescope project, helping to define operational requirements for the orbiting telescope and to design an instrument that would be placed onboard. I became almost exclusively a “space astronomer,” only rarely working at groundbased observatories.

Over the years, I’ve had the opportunity to lecture on cruise ships and tours devoted to chasing eclipses or viewing a famous comet, and recently I’ve begun speaking at amateur astronomers’ “star parties.” These are gatherings of thousands of amateurs and members of the public who converge on a country location for a night or two of celestial viewing. These events are the best way to get into astronomy now, at least for the amateurs. Professional astronomers use robotic equipment almost exclusively, or large facilities operated by staff controllers, not the researchers. Professionals are trained in physics nowadays and may make marvelous discoveries with telescopes they’ve never touched.

Amateur astronomers, however, still enjoy the constellations, the Milky Way, the meteor showers, the passing bright satellites like Hubble, and the meanderings of the planets across the background sky. I've been fortunate to enjoy both kinds of astronomy, and I'd do it again!